USDA Foreign Agricultural Service
GAIN Report
Global Agriculture Information Network
Template Version 2.09

Required Report - Public distribution

Date: 5/29/2008

GAIN Report Number: TH8083

Thailand

Bio-Fuels

Annual

2008

Approved by:
Gary Meyer, Agricultural Counselor
U.S. Embassy

Prepared by:
Sakchai Preechajarn, Ponnarong Prasertsri, Maysa Kunasirirat

Report Highlights:
The Royal Thai Government (RTG) has initiated several measures supporting bio-fuel production and use in Thailand. These policies should stimulate gasohol and biodiesel consumption growth over the next few years. It is anticipated that gasohol consumption will dominate the gasoline market by 2012.

Includes PSD Changes: No
Includes Trade Matrix: No
Annual Report
Bangkok [TH1]
[TH]

Table of contents

Executive Summary

The Royal Thai Government (RTG) has initiated several measures supporting bio-fuel production and use in Thailand. These include providing tax incentives to automobile manufacturers and producers of gasohol and biodiesel, imposing mandatory B2 biodiesel production, and providing low interest loan to palm producers. It is anticipated that gasohol consumption will dominate the gasoline market by 2012 and demand for B100 biodiesel will reach more than 1 billion liters by 2012.

Despite growing demand for ethanol, nearly all existing ethanol plants are facing current supply surpluses and increased input prices. As a result, nearly all ethanol plants are running at only 70 percent of their production capacity while some have either suspended production or switched to non-ethanol products. For biodiesel, the current government policy on mandatory B2 production guarantees the sale quantity and prices to manufacturers, but concerns linger that palm oil production could be a bottleneck for the industry if palm plantings do not increase as planned.

I. Bio-fuels Policy

1. Domestic Policy Environment

1.1. Policy Supporting Production and Use of Bio-fuels

Gasohol

As of January 1, 2008, the Royal Thai Government (RTG) launched E20 gasohol (a mixture of 20 percent ethanol and 80 percent premium gasoline) following a surge in E10 gasohol sales last year. Retail E20 gasohol is sold at 6 baht/liter lower than premium pure gasoline, and 2 baht/liter lower than E10 gasohol. According to the Department of Alternative Energy Development and Efficiency, Ministry of Energy, E20 gasohol consumption is estimated at 0.25 million liters/day in 2008, and is forecast to increase to 1.23 million liters/day or 5 percent of total gasoline consumption by 2011. E20 gasohol consumption should increase gradually over the next few years as most vehicles currently on the road are not compatible with E20.

Concerns over skyrocketing petroleum prices has forced the Government to announce that the new E85 gasohol (a mixture of 85 percent ethanol and 15 percent premium gasoline) will begin commercialization in the fourth quarter of 2008, three years ahead of the original plan. Retail prices for E85, as announced by the government, will be 30-40 percent cheaper than premium gasoline. In addition, the Government will provide higher tax incentives to automobile manufacturers who invest in compatible E85 vehicles. The excise tax on E85 vehicles will be charged at lower rates than that for E20 vehicles (currently 25 percent) and regular vehicles (30-50 percent).

The RTG estimates ethanol consumption will reach 2.4 million liters/day by 2011. At present, total ethanol consumption is 0.8 million liters/day, up from 0.5 million liters/day in 2007, as a result of increased domestic gasohol consumption.

Biodiesel

As of February 1, 2008 the Royal Thai Government (RTG) began to enforce compulsory production of B2 biodiesel (high-speed diesel with the two percent of B100 content by weight) throughout the country. Through this program, the RTG hopes to increase domestic use of alternative energy in the face of skyrocketing global oil prices. In addition, the RTG provides B2 manufacturers a subsidy of 0.30 Baht/liter from the State Oil Fund to support this program.

The requirement has made a noticeable impact on demand for domestic palm oil, the only raw material for B100 biodiesel production at the moment. It is estimated that demand for crude palm oil and stearin (palm oil by-product) will be 492 million liters per year by 2010, as compared to only 31 million liters in 2006.

Realizing that Thailand needs to increase palm oil production to meet the demand, the joint working group from the Ministry of Agriculture and Cooperatives and the Ministry of Energy, called "Committee on Biofuel Development and Promotion" (CBDP), has plans to expand palm growing area by 400,000 hectares. Additionally, the committee will seek to increase fresh palm

productivity from 19 tons/hectare to 22 tons/hectare, and to increase the crushing rate of crude palm oil from 17 percent to 18.5 percent by 2012. To achieve the plan, the RTG will provide low-interest loans to participating oil palm farmers. In addition, the RTG plans to push compulsory biodiesel production up from B2 to B5 across the country by 2011. Based on estimated diesel demand of 22,860 million liters in 2012, mandatory B5 production could lead to demand of 1.08 million tons of crude palm oil and stearin for biodiesel production.

However, increasing palm plantings to meet demand has been challenging. In 2006, increased palm acreage was only 48,000 hectares, 40 percent below the annual target. Slower than expected expansion is attributed to more attractive returns from rubber production and the lack incentives for increasing palm plantings. Consequently, the RTG is now adjusting its campaign by promoting palm plantation in non-rubber areas in the North and Northeast regions of Thailand.

	Biodiesel Community, Biodiesel Standardization		**Biodiesel B5 on sales in some areas**	**B2 on sales nationwide, starting from February 1,2008**			**B5 on sales nationwide**	
	2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
	-	-	-	0.5	0.5	0.5	0.5	0.5
Expand Palm Plantation Area (M.T./year)	***Develop palm yield from 2.7 to 3.3 tons/rai/year***			***Expand palm plantation area 2.5 million rais***				
Demand of B100 (M.L./day)	0.0007	0.006	0.13	1.35	1.35	1.35	3.07	3.20
Sales plan of B2/B5/B100 (M.L./day)	0.015	0.12	8.2	55.6	57.3	58.7	60.3	62.7
Demand of CPO for B100 production	0.0002	0.002	0.045	0.35	0.35	0.35	0.84	0.87
Demand of sterin for B100 production	n.a.	n.a.	n.a.	0.11	0.11	0.11	0.20	0.21

1.2 Size of Energy Market

By the end of 2008, gasohol consumption is estimated to double over the 2007 level to 8.5 million liters/day, due to its price advantage over pure gasoline. Prices for gasohol and E20 are currently cheaper than premium gasoline by 3-3.5 baht/liter (10 US cents/liter) and 6 baht/liter (20 US cents/liter). Although gasohol now captures only a quarter of total gasoline consumption, it is anticipated to dominate the gasoline market by 2012 when E20 and E85 vehicles are more available in the market.

Diesel consumption in 2007 was 51.1 million liters/day (3.2 million barrels/day), and is estimated to rise by 8 percent to 55.6 million liters/day in 2008. Total consumption of B100 will increase sharply as a result of mandatory B2 use in all high-speed diesel production. According to the Department of Energy Business, the consumption of B5 and B2 in May 2008 is 7.52 and 45.9 million liters/day, respectively, which is translated to 1.29 million liters/day of B100.consumption.

1.3 Bio-fuels Production

Gasohol

The RTG has supplied 45 licenses to ethanol manufacturing companies with a combined production capacity of around 12 million liters/day. However, only 11 plants have come online. Of this, 8.4 million liters are cassava-based ethanol from 24 plants and the balance comes from molasses/sugar-based ethanol (2.2 million liters/day) from 12 plants and tapioca/molasses-based ethanol (1.4 million liters/day) from 9 plants.

Out of 11 online facilities with production capacity of around 1.6 million liters/day, ten are molasses-based and one is a tapioca-based ethanol plant (150,000 liters/day capacity). In April 2008, eight ethanol plants, all molasses-based, were running at 70 percent of their capacities. Meanwhile, the tapioca-based ethanol plant is suspending its operation as tapioca prices increased significantly, making ethanol production unfeasible. One molasses-based ethanol plant has also suspended production, while the other shifted to Acetic acid production. Industry sources report that the current ethanol surplus remains high, at around 16 million liters. Exports of surplus ethanol have been marginal thus far.

By the end of 2008, ethanol plants are expected increase to 17 plants, up by six, with potential production capacity of around 2.7 million liters/day. Most of six additional plants will be tapioca-based ethanol, except for two of them which will be molasses/tapioca-based ethanol plants. Despite anticipated expansion in ethanol production capacity in CY 2008, domestic supplies of sugarcane and cassava will remain sufficient. Sugarcane production in CY 2008 is revised upward to 72 million tons due to an average yield improvement following favorable weather conditions (TH8057). Molasses supplies are expected to increase to 3.2 million tons, which will likely keep domestic molasses prices at low levels of around 2,000 – 3,000 baht/ton (roughly U.S. $60-90/MT). Around 1.5 million ton of molasses will be used in food industries (mostly for liquor production), and the balance will be for exports and fuel ethanol production. Molasses demand for ethanol production will likely increase to 1.3 – 1.8 million tons in CY 2008, up significantly from the previous year. Meanwhile, cassava production is forecast to continue an upward trend to around 27 million tons in CY 2008. Presently, around 12 million tons are used for flour production, and 10 million tons for cassava chip and pallets for domestic and export market. The balance will likely be far above domestic demand for cassava-based ethanol production which is expected to utilize around 2 million tons of cassava by the end of 2008. However, over the medium-term when all cassava-based ethanol plants start ethanol production, exportable supplies of cassava products will be limited under the current average yield of 3.7 tons/rai (23 tons/hectare).

Biodiesel

The anticipated increase in demand for crude palm oil is affecting domestic prices for fresh palm and palm plantation. Domestic prices for fresh palm fruit increased sharply in late 2007, reaching a record high of 6-6.3 Baht/ kg ($190-$206/ton) in January 2008. Meanwhile, production of crude palm oil (CPO) in 2008 is estimated to increase from 1.05 million tons in 2007 to 1.4 million tons due mainly to increased harvested area, favorable weather conditions in the past year and a half, and increased fertilizer use. Industry sources views the CPO production level should be enough to meet demand for B100 biodiesel production in 2008.

At present, nine B100 biodiesel plants are operating at half of their production capacity of 2.19 liters/day. Although the current government policy on mandatory B2 production warrants sale quantities and prices to manufacturers, they are still concerned that CPO production could be a bottleneck for expanding.

2. Import and Export Regimes for Bio-Fuels

Thailand does not apply a quota system or other trade barriers to the importation of gasohol and biodiesels. Previously the Government imposed a tariff rate of 2.50 baht/liter (about 27 US cents/gallon) on imported ethanol mainly because imported ethanol is used for liquor production. However, in CY 2005, the insufficient domestic ethanol supplies caused the Government to allow ethanol imports of around 24 million liters duty-free in order to counter a shortage. As of 2007, Thailand exported 14.4 million liters of ethanol due to excess domestic supplies. However, the Government discourages ethanol exports in order to guarantee sufficient domestic supplies for gasohol production. Despite this, efforts to replace premium gasoline with gasohol have been modified from a compulsory basis to a price-incentive basis. Most ethanol producers plan to supply ethanol domestically; particularly those who do not have sugar mill businesses, due to concerns over sourcing inputs. At the moment, around 350,000 liters have been approved for export to the Philippines.

As for corn sweetener (both solid and liquid), imports are subject to a 20 percent tariff rate. Imports of palm oil are subject to tariff rate quota system with the in-quota tariff being 20 percent.

II. Statistics

Table 1 Quantity of Feedstock Use in Biofuel Production in MT

	2003	2004	2005	2006	2007	2008
Biodiesel						
Vegetable oil						
Soybean Oil	0	0	0	0	0	0
Rapeseed Oil	0	0	0	0	0	0
Palm Oil	0	0	20815	21149	45000	350000
Coconut Oil	0	0	0	0	0	0
Animal Fats	0	0	0	0	0	0
Recycled Vegetable Oil	0	0	0	0	0	0
Other						
Ethanol						
Corn	0	0	0	0	0	0
Wheat	0	0	0	0	0	0
Sugarcane		0	0	25000	57345	60000
Sugar beat	0	0	0	0	0	0
Rye	0	0	0	0	0	0
Molasses	862	25180	292105	440800	613663	1189280
Wood	0	0	0	0	0	0
Cassava/tubers	0	0	0	163800	240240	196560

Table 2 PS&D Table for Bio-fuels in Thailand (Million Liters)

	2003	2004	2005	2006	2007	2008
Biodiesel/Ethanol						
Beginning Stocks	0	0	0	30	36	41
Production	0	6	94	156	192	822
Imports	0	0	24	0	0	0
Total Supply	0	6	118	187	227	863
Exports	0	0	0	0	14	50
Consumption	0	6	88	149	172	749
Ending Stocks	0	0	30	38	41	64
Total Demand	0	0	118	187	227	863

Table 3 Registered Ethanol Manufacturers in Thailand, as of May 21 2008

	Industry	Location	Raw material	Capacity (Liter/day)	Avg. Actual Production (Liter/day)
Status : Registered and On-production Ethanol Manufacturers in Thailand					
1	Ponwilai	Ayudhaya	Molasses	25,000	-
2	Thai Alcohol	Nakornprathom	Molasses	200,000	104,381
3	Thai Agro	Supanburi	Molasses	150,000	109,842
4	Thai Nguan Ethanol	Khonkean	Tapioca	130,000	-
5	Khonkean Alcohol	Khonkean	Cane/Molasses	150,000	129,551
6	Thai Sugar Ethanol	Kanchanaburi	Cane/Molasses	100,000	102,520
7	Petro Green	Chaiyapoom	Cane/Molasses	200,000	162,757
8	K.I. Ethanol	Nakornratchasima	Cane/Molasses	100,000	89,029
9	Ekarat Pattana	Nakornsawan	Molasses	200,000	-
10	Thai Ruangruong Energy	Saraburi	Cane/Molasses	120,000	28,280
11	Petro Green	Kalasin	Cane/Molasses	200,000	160,653
	Total			1,575,000	887,013
Status : Registered and Under Construction Ethanol Manufacturers in Thailand					
1	I.E.C. Business Partners	Rayong	Tapioca	150,000	n/a
2	Fha-kwantip	Prajinburi	Tapioca	60,000	n/a
3	Ratchaburi Ethanol	Ratchaburi	Tapioca/Molasses	150,000	Q3-2008
4	E.S. Power	Srakaew	Cane/Molasses	150,000	Q3-2008
5	Srima Inter Products	Chachoengsao	Cane/Molasses	150,000	Q4-2008
6	Supthip	Lopburi	Tapioca	200,000	Q4-2008
7	P.S.C. Starch Products	Chonburi	Tapioca	150,000	Q2-2008
8	T.P.K Ethanol	Nakornratchasima	Tapioca	340,000	Q3-2008
9	Impress Technology	Chachoensao	Tapioca	200,000	Q4-2009
10	Boonanek	Nakornratchasima	Tapioca	350,000	Q2-2009
11	Double A Ethanol	Srakaew	Tapioca	500,000	Q1-2009

Table 4 Thailand's B100 biodiesel manufacturers and their production capacities

Plant	Production Capaciy (liters/day)
BangChak Petroleum Plc.	50,000
Bio Energy Plus Co.,Ltd.	100,000
Sun Tech Palm Oil Co.,Ltd.	200,000
Pathum Vegetable Oil Co.,Ltd.	300,000
Bangkok Alternative Energy Co.,Ltd.	200,000
Green Power Corporation Co.,Ltd.	200,000
A I Energy Co.,Ltd.	250,000
WeeraSuwan Co.,Ltd.	200,000
Thai Oleo	650,000
Total	2,185,000

Table 5 Estimation of demand in crude palm oil for biodiesel industries

Item	2008	2009	2010	2011	2012
1) Diesel Consumption (M.L./day)	55.6	57.3	58.7	60.3	62.7
2) Estimation of Demand		**B5/B2**		**B5**	
2.1) B100 for B2 Production (M.L/day)	0.92	0.92	0.92	0	0
2.2) B100 for B5 Production (M.L./day)	0.43	0.43	1.43	3.01	3.13
2.3) B100 For Biodiesel (M.L./day)	0	0	0	0.06	0.07
3) Total demand for B100 per day	1.35	1.35	1.35	3.07	3.20
4) Total demand for B100 per year	492	492	492	1,121	1,167
Item	**2008**	**2009**	**2010**	**2011**	**2012**
Demand in raw material	0.48	0.48	0.48	1.04	1.08
- Crude Palm Oil (CPO) (MMT./year)	0.35	0.35	0.35	0.84	0.87
- Stearin (MMT./year)	0.11	0.11	0.11	0.20	0.21

Table 6 Thailand's Petroleum Consumption (Unit: Million Liters)

Type	2003	2004	2005	2006	2007	% change	
						2006	2007
Gasoline							
Regular (octane 91)	4550	4631	4332	4464	4467	3.0	0.06
Premium (octane 95)	3082	2969	2240	1471	1106	-34.33	-24.8
Gasohol							
Gasohol (octane 91)	0	0.083	29.197	94.479	244.256	223.6	158.29
Gasohol (octane 95)	0	14.08	645.74	1,184.81	1,518.50	83.5	28.16
High Speed Diesel	17,449	19,517	19,341	18,213	18,046	-5.8	-0.91
Biodiesel B5	0	0.118	5.445	42.95	627.45	688.8	1360.61

Source: Energy Policy and Planning Office, Ministry of Energy

End of Report.